

# (12) UK Patent Application (19) GB (11) 2020535 A

(21) Application No 7912011

(22) Date of filing

5 Apr 1979

(23) Claims filed

5 Apr 1979

(30) Priority data

(31) 53/054028U

(32) 22 Apr 1978

(33) Japan (JP)

(43) Application published

21 Nov 1979

(51) INT CL<sup>2</sup> A24D 1/12

(52) Domestic classification

A2C 2B

(56) Documents cited

GB 1509278

(58) Field of search

A2C

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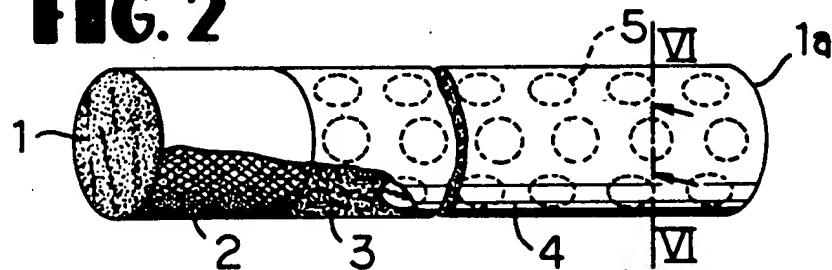
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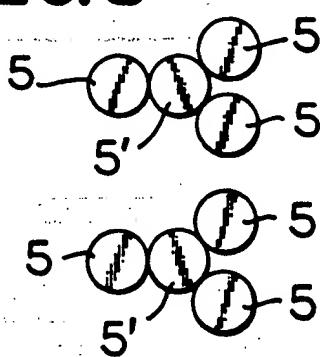
## (54) Improved cigarette wrappers

(57) A cigarette which is stuck with plural pieces of metal foil on either inner or outer side of the wrapping paper thereof between the out end and the draw end, in a predetermined arrangement pattern, either individually independent or linked by some pieces into a group. The cigarette is sometimes provided with a metal foil of cylindrical form, with a predetermined length, stuck on the wrapping paper between the draw end and the plural pieces of metal foil. The draw end may be made into a filter. The pieces of the metal foil effectively reduce fire risk, decrease the production of carcinogenic substance, and do not spoil the smoker's pleasure.

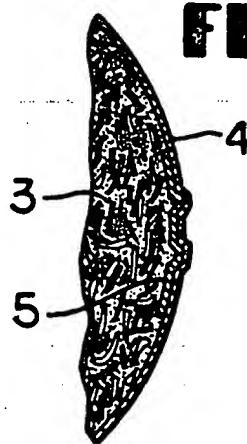
**FIG. 2**



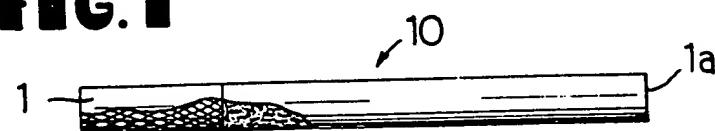
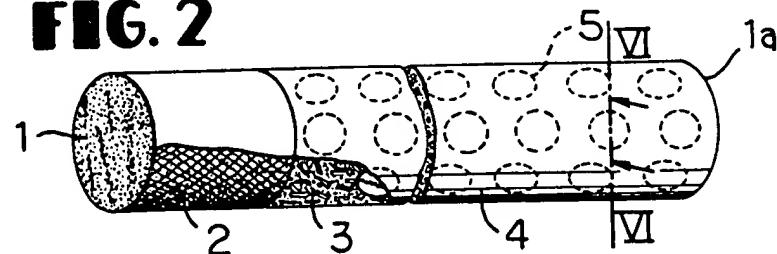
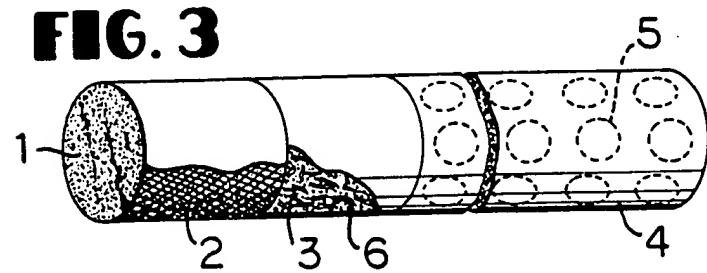
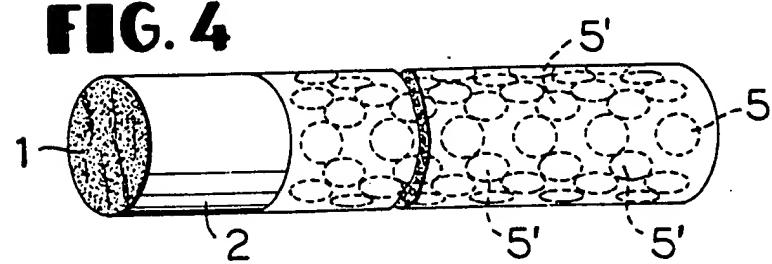
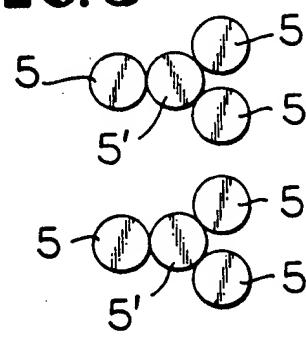
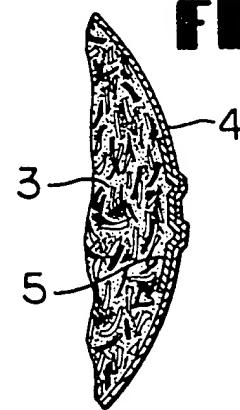
**FIG. 5**



**FIG. 6**



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**FIG. 1****FIG. 2****FIG. 3****FIG. 4****FIG. 5****FIG. 6**

## SPECIFICATION

## A fire preventive cigarette

## 5 BACKGROUND OF THE INVENTION

The present invention relates to a cigarette, more particularly, to the construction of a cigarette which is capable of preventing a fire caused by the smoking thereof, and which 10 allows, on the other hand, the ashes to appropriately fall down as it goes on burning.

Cigarettes have been traditionally far more popular and larger in the amount of consumption in comparison to cigars because of their 15 smaller size, lighter weight, lower prices and other advantages. People are, however, aware of some grave disadvantages of cigarettes, such as great possibility of causing a fire, assumption of carcinogenic substance for the 20 notorious lung cancer produced by the burning of the cigarette wrapping paper, etc. Many ideas and devices have been proposed and practiced so far with little success.

A cigarette, for example, wherein a small 25 capsule containing water therein is imbedded longitudinally along the axial line of the tobacco portion of the cigarette, is known (JITSU-KAI-SHO-49 (1974)-23600, JITSU-KAI-SHO-51 (1976)-110099). Another is a 30 cigarette wherein an aluminum foil with a lot of perforated holes or apertures is stuck inside or outside of the tobacco wrapping paper (JITSU-KAI-SHO-49 (1974)-11500, JITSU-KAI-SHO-50 (1975)-153300). The former is, 35 as can easily be imagined, too impractical either because of smoker's ill feeling and of trouble in manufacturing process. The latter is advantages, indeed, in largely preventing possibility of incurring a fire when it is dropped 40 on a carpet or other floorings such as matting and in reducing the production of carcinogenic substance; it can not, however, be free from demerits of not to be extinguished until it is burnt out, once it is lit, and of disagreeable 45 feeling to the smoker's fingers as the cigarette becomes too hot during the smoking. Especially in the latter the smoker has to treat with his fingers the cinder of the metal foil and the ashes sticking to the metal foil, 50 against his wishes of comfortable smoking feeling.

## SUMMARY OF THE PRESENT INVENTION

It is a primary object of this invention to 5 provide a cigarette which is capable of preventing a fire caused by the smoking thereof, and which allows the ashes to appropriately falls down as the burning advances.

It is another object of this invention to provide a cigarette which is capable of enjoying the merit of fire prevention by means of being wrapped or covered with a metal foil(s), while giving a smoker comfortable smoking feeling which relieves the smoker from handling a long cinder of tobacco and metal foil

It is still another object of this invention to provide a cigarette, wherein fire is automatically extinguished after burning of a predetermined length of the tobacco portion of the 70 cigarette.

It is further object of this invention to provide a cigarette which diminishes burning of the wrapping paper portion, being assumed to be carcinogenic to the lung cancer.

75 Other features and objects of this invention will be apparent from the studying of the following description and the appended drawings.

This invention is to provide a cigarette of a 80 kind which is stuck with plural pieces of metal foil scattered in a certain pattern or others, in order to attain the above-mentioned objects, on the inner side or outer side of the tobacco wrapping paper, ranging from the out end to 85 the draw end of the cigarette. Such a cigarette may be preferably provided with an annular or cylindrical metal foil, with the width or length in the longitudinal direction of the cigarette one or two times of the cigarette 90 diameter, stuck on the wrapping paper between the drawn end and the scattered metal foils with a certain pattern, while keeping a certain clearance or a gap between the two, in order to extinguish the fire by itself when it 95 has reached the annular metal foil on the wrapping paper. Another device of linking the small metal foils by a certain number into several groups is also effective in reducing the danger of incurring a fire from the smoking.

## 100 BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a plan view of a cigarette for showing a first embodiment partially broken away;

105 Figure 2 is an enlarged perspective view of the cigarette in Fig. 1 partially broken away;

Figure 3 is an enlarged perspective view of a cigarette of a second embodiment partially broken away;

110 Figure 4 is an enlarged perspective view of a cigarette of a third embodiment partially broken away;

Figure 5 is a plan view showing a pattern of a metal foil arrangement; and

115 Figure 6 is an enlargement of a section taken along the line VI-VI of Fig. 2.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

120 With reference to Fig. 1, a cigarette with a filter in accordance with a first embodiment is generally indicated by 10, partially broken away, in which little difference is perceived from an ordinary cigarette, especially at an

125 outer appearance thereof. Since the cigarette 10 is provided with a mouthpiece 1, shown in the left part of Fig. 2, made into a filter 2 of a bundle of fibers arranged in good order, such as of acetate rayon, and a tobacco portion 3

width of approximately 0.5 mm-1.0 mm) wrapped with a sheet of paper 4 (referred to as paper portion 4) in the right part of Fig. 2, it gives an almost similar appearance with an ordinary cigarette. An essential difference, though being difficult to be perceived from outside, lies in that a number of small aluminum foils 5 of similar configuration (hereinafter simply called aluminum foil 5) are stuck on the inner side of the paper portion 4.

Although the paper portion 4 is made of a thin wrapping paper which is similar to the ordinary cigarette wrapping paper, it shows peculiar effects with the aid of the aluminum foils 5 stuck on the inner side thereof.

The aluminum foils 5 are of thickness 5-15  $\mu$ , preferably 5-10  $\mu$ , being punched out of a sheet foil in a circular shape of diameter about 2 mm. They are, with an inter-distance of 0.5-2.0 mm, stuck simultaneously or soon after the punching on the inner side of the paper portion 4 so as to form a certain predetermined arrangement pattern. Means or method of sticking is not a so important factor; physical engagement method by means of making uneven surface on either of paper and foil, chemical method of employing an adhesive, etc., are practicable. Advantageously, a method of firmly engaging the foils 5 on the wrapping paper is, as shown in Fig. 6, exerted at the time of punching of the aluminum foils 5. Arrangement of aluminum foils 5 in a predetermined pattern is a quite easy job. As to the size of the aluminum foils 5, the maximum outer diameter of 1.0-4.0 mm, preferably 1.5-3.0 mm, is recommendable (as the aluminum foil(s) of this embodiment is of circular form, the size is to be understood as the diameter).

In smoking of such a cigarette, the tobacco is burnt either during the smoking and while being rest on an ash tray after being lit of fired, and the ashes fall down as the burning advances without being retained on the outer end of the burnt cigarette. A cigarette of this invention never spoils or mars the feeling of the smoker regarding the treatment of the ashes. If the aluminum foil(s) should define an integral cylindrical space, as in conventional ones, the ashes would be retained within that cylindrical space, not suitably falling down, leaving the problem of a disagreeable treatment of ashes.

Another merit of this embodiment is a fire prevention; the burning heat of the tobacco which locally amounts to a high temperature is absorbed and distributed appropriately by a number of aluminum foils 5 of good heat conducting nature to effectively prevent the fire, even when the cigarette is thrown away or put on a place which may catch a fire, for example, on a carpet, matting, etc. In other words, the thickness, area, arrangement distance of the aluminum foils 5 are predeter-

the surface temperature of a cigarette not to cause the things around the cigarette to flame up. The specific dimension mentioned earlier are the results which have been got after a series of experiments. Circular or nearly circular in shape is preferable in accordance with the study; it is, however, not necessarily limited to circularity.

A cigarette according to this invention is successful in being preventive of fire, even when it is dropped or carelessly rest on a carpet or matting easy to catch fire. Another advantage is a decrease of producing carcinogenic substance, because the burnt area of the paper portion 4 is largely reduced by the sticking of the aluminum foils 5 stuck on it. Incombustibility of the aluminum foils 5 naturally reduces the burning of paper portion 4, which is assumed to be carcinogenic, by that amount. In the event the burning comes as far as the filter portion 2, it naturally ceases, i.e., does not continue any longer because of the filter 2 being relatively flame-resisting.

With reference to Fig. 3, a second embodiment will be explained. Adjacent to the filter portion 2 of the draw end or mouthpiece 1 a non-perforated aluminum foil of cylindrical form 6 is stuck on the inner side of the paper portion 4. The thickness of the aluminum foil 6 is preferable to be 5-15  $\mu$ , especially advantageous being 5-10  $\mu$ , and the length is desired to be 1-2 times of the outer diameter of the cigarette 10. Beyond the cylindrical aluminum foil 6 toward the out end a plurality of circular aluminum foils 5 are stuck, just alike in the first embodiment, on the wrapping paper with a predetermined inter-distance among themselves. An important thing in this instance is that the fire going on burning from the out end toward the draw end begins to dwindle as soon as it reaches the cylindrical-aluminum foil 6 because of oxygen shortage and cooling effect therein, finally dying out. The cylindrical aluminum foil 6 thus advantageously extinguishes the fire of the cigarette 10 in due time even if the lit cigarette is rest untouched on whatever material. The thickness and length of the aluminum foil 6 must be determined so as to timely extinguish the fire of the burning cigarette.

This cylindrical aluminum foil 6 has a peculiar effect of limiting the oxygen supply to the burning tobacco inside the wrapping paper and simultaneously taking off much of the heat necessary for burning. The burning of the cigarette 10 is thus naturally and surely ceased.

With reference to Fig. 4, a third embodiment will be described. Aluminum foils 5 in the first embodiment are, in this instance, linked by distributing a certain number of aluminum foils 5' of circular form in the vacant spaces between the pre-arranged aluminum foils 5 in a certain pattern, i.e., so as

linkage is carried out to divide all of the aluminum foils into a few groups of mutually connected foils, which are suitably arranged on the wrapping paper. The number of aluminum foils to be linked into one group is desirable to be 2-20, preferably 4-10. Linkage of too many foils is liable to extinguish the fire of a burning cigarette. The distribution of linked foils to such a preferable extent is also suitable for punching process of the foils. Two times of press-punching of the foils for 5 and 5' is enough for the exemplified case.

In this embodiment the fire preventing effect is much better than in the first embodiment, because the local superheat can be prevented by the diffusion of heat among the linked foils. Besides, the remaining ashes of a burnt cigarette appropriately fall down in this instance without spoiling the smoker's feeling by the treatment of the ashes. Between the groups of the aluminum foils including 5 and 5', there are several rifts or breaks for allowing the burnt paper portion 4 to drop one after another, without making it one piece connected.

In the above-described embodiments aluminum foils of circular form are stuck on the inner side of the paper portion 4. This invention is not limited only to those examples, but other shapes of foils, such as square, other metal foils, such as tin foil, and sticking the foils on the outer side of the paper portion 4 are all permissible.

As to the thickness, diameter, and arrangement distance of the circular aluminum foil 5 and the thickness and length of the cylindrical aluminum foil 6, the dimensions are designated by way of preferable examples; variations are of course practicalbe within the sphere of the invention.

To summ up the effect of this invention, (1) it is excellent in the prevention of fire, because the burning temperature of a cigarette does not rise enough to make the surrounding things, such as carpet or matting, catch fire, while continuing the smooth burning of itself, (2) it will not spoil the smoker's feeling in respect of treatment of the ashes, since the ashes are allowed to drop timely without remaining too much on the burning end, and (3) it effectively reduces the production of carcinogenic substance susceptible to notorious lung cancer through the decrease of paper portion to be burnt.

#### 55 CLAIMS

1. A cigarette with plural pieces of metal foil characterized in that said pieces of metal foil are stuck on either inner- or outer side of the wrapping paper portion in a predetermined arrangement pattern, between the outer end and the draw end of said cigarette.
2. A cigarette as set forth in claim 1, wherein said metal foil is of thickness 5-14  $\mu$  and of the greatest outer diameter 1-4 mm.

3. A cigarette as set forth in claim 1, wherein a metal foil of cylindrical form, having the length in the longitudinal direction of said cigarette one to two times of the cigarette's diameter, is stuck on said paper portion, between said draw end and said plural pieces of metal foil.

4. A cigarette as set forth in claim 1, wherein said plural pieces of metal foil are arranged on said paper portion, without being mutually connected, keeping a clearance of 0.5-2.0 mm among each other.

5. A cigarette as set forth in claim 1, wherein said plural pieces of metal foil are, not all individually independent, but linked by a predetermined number of pieces into a group, forming eventually a plurality of groups separated from each other.

6. A cigarette as set forth in claim 5, wherein the number of pieces of metal foil linked into one group is in the range 2-20.

7. A cigarette as set forth in claim 1, wherein said plural pieces of metal foil are made of aluminum and of the same size 90 circular form.

8. A cigarette as set forth in claims 1, 2, 3, 4, 5, 6, or 7, wherein said draw end is made into a filter.

Printed for Her Majesty's Stationery Office  
by Burgess & Son (Abingdon) Ltd.—1979.  
Published at The Patent Office, 25 Southampton Buildings,  
London, WC2A 1AY, from which copies may be obtained.